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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/650,450	08/27/2003	Rinaldo Poluzzi	854063.734	7138

500 7590 11/17/2005

SEED INTELLECTUAL PROPERTY LAW GROUP PLLC  
701 FIFTH AVE  
SUITE 6300  
SEATTLE, WA 98104-7092

EXAMINER

DESTA, ELIAS

ART UNIT PAPER NUMBER

2857

DATE MAILED: 11/17/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

H.A

<b>Office Action Summary</b>	<b>Application No.</b> 10/650,450	<b>Applicant(s)</b> POLUZZI ET AL.	
	<b>Examiner</b> Elias Desta	<b>Art Unit</b> 2857	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 14 June 2005.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-38 is/are pending in the application.
- 4a) Of the above claim(s) 6-23 and 26-33 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1, 2, 5, 24, 25 and 34-38 is/are rejected.
- 7) ☒ Claim(s) 3, 4 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 August 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>01/20/2004</u> . | 6) <input type="checkbox"/> Other: _____  |

## **Detailed Action**

### **Response to Remarks**

1. Applicant's arguments (see response filed June 14, 2005) with respect to the restriction requirement have been fully considered and acknowledged. The Examiner agrees that claims 1, 24 and 34 are generic.

### **Drawing**

2. The drawing is objected to because of the following minor informalities:
  - Figs. 7 and 11: the first oval unit in the flow chart should be labeled as 'Start'

### **Specification**

3. The specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

### **Claim rejection – 35 U.S.C 102**

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) The invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

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5. Claims 1, 2, 5, 24 25, 34, 35 and 38 are rejected under 35 U.S.C. 102(b) as anticipated by Russo (IEEE Article, 'Noise Removal from Image Data Using Recursive Neuro-Fuzzy Filters').

In reference to claims 1, 24 and 34: Russo teaches method for filtering electrical signals (see Russo, page 1818, Abstract and page 1819, Fig. 1). The method includes a number of inputs arranged spatially at a distance from one another and supplies respective pluralities of input signal samples (see Russo, page 1819, Fig. 1, input layer,  $X_{i+n, j+m}$ , where  $n$  and  $m$  are integers). The output supplies a plurality of filtered signal samples at the output layer (see Russo,  $Y_{i+n, j+m}$ , where  $n$  and  $m$  are integers and see also page 1820, section 3, 'The hidden output stage'). The method further includes:

- A number of signal processing channels, each processing channel being formed by a neuro-fuzzy filter to receive a respective plurality of input signal samples and to generate a respective plurality of reconstructed samples (see Russo, Fig. 1, first through third hidden layer, and page 1821, Fig. 3); and
- Adder unit to receive plurality of reconstructed samples and having an output to supply the plurality of filtered signal samples (see Russo, page 1819, Fig. 1, the fourth hidden layer or the adder circuits with an output  $G_n$ ).

With regard to claim 2: Russo further teaches that the method includes a routing means (see Russo, page 1819, fig. 1, output layer  $G_n$ ) inherently connected to the output of the adder unit and controlled so as first to supply the filtered signal samples

back to the signal processing channels, then to supply the filtered signal samples to the device output because when the output of the amplitude is small, the filtering action is reduced according to the higher degree of uncertainty. Hence, the operation is designed to be recursive, i.e. the new values  $y_{i-1,j}$  and  $y_{i+1,j}$  are respectively assigned to  $x_{i-1,j}$  and  $x_{i+1,j}$  at the end of processing.

With regard to claim 5: Russo further teaches that each signal-processing method includes a binary weight that describes the strength of connection between the hidden layers which are weights connected to the neuro-fuzzy filters hence method has a means to store filter weights in order to establish the interrelationship between subsequent hidden layers (see Russo, Fig. 1, first through fourth hidden layer).

With regard to claim 25: Russo further teaches that the added signal samples are supplied to the neuro fuzzy filters (see Russo, Fig. 1, Gn). The adding and filtering is repeated in order to obtain a filtered signal samples output because the operation is recursive, i.e. new output values are respectively assigned to the input at the end of processing (see Russo, page 1820, last paragraph).

With regard to claim 35: Russo further teaches that the method includes a means for updating filter weights used by the neuro-fuzzy network because the strength of the neuro-fuzzy network is represented by the binary weight that describes the connection between the node and a given hidden layer (see Russo, page 1820, 2<sup>nd</sup> paragraph, right above section 2.4).

With regard to claim 38: Russo further teaches that the binary weights that describe the strength of the connection between the nodes and the hidden layer have a

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symmetry relationship relative to the source of the signal (see Russo, page 1820, 2<sup>nd</sup> paragraph).

### **Claim rejection – 35 U.S.C. 103**

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 36 and 37 are rejected under 35 U.S.C. 103(a) as obvious over Russo (IEEE Article, 'Noise Removal from Image Data Using Recursive Neuro-Fuzzy Filters').

In reference to claims 36 and 37: Russo further teaches that the recursive neuro-fuzzy filters are used to remove noise from image data by detecting changes in the anticipated image and training these changes for subsequent detection. However, even though Russo does not teach detecting changes in acoustic scenario, it would have been obvious to one having ordinary skill in the art at the time the invention was made to train the neuro-fuzzy logic taught by Russo for applications in acoustic scenario because both acoustic and image scenario represent a data type and most acoustic data types are often imbedded with image signals.

### **Allowable Subject Matter**

8. Claims 3 and 4 objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

## Conclusion

9. Citation of pertinent prior art:

- Russo (IEEE Article, 'Nonlinear Filtering of Noisy Images Using Neuro-Fuzzy Operators') teaches a neuro-fuzzy approach to a nonlinear filtering of noisy images.
- Watanabe et al. (U.S. Patent 5,875,284) teaches neuro-fuzzy integrated data processing system.
- Rahman et al. (U.S. Patent 5,594,835) teaches neural-fuzzy logic control system with adjustable fuzzy logic membership functions.
- Khan et al. (U.S. Patent 5,606,646) teaches recurrent neural network-based fuzzy logic system.
- Doyle et al. (IEEE Article, 'Multi-sensor Data Fusion for Helicopter Guidance Using Neuro-Fuzzy Estimation Algorithms') teaches a link between fuzzy networks and associative memory neural networks.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Elias Desta whose telephone number is (571)-272-2214. The examiner can normally be reached on M-Thu (8:30-7:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marc S. Hoff can be reached on (571)-272-2216. The fax phone numbers for the organization where this application or proceeding is assigned are (571)-272-8300 for regular communications and for After Final communications.

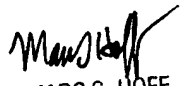
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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (571)-272-1750.

Elias Desta  
Examiner  
Art Unit 2857

-ed

November 9, 2005

  
MARC S. HOFF  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2800